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aboni
GmbH für Mess- und
Automatisierungstechnik

FMX HydroTracer

moisture meter for solids



**Trace moisture in solids:
An easy and accurate measurement**

The FMX HydroTracer is a precise instrument measuring low water contents in solids. The precision of the method combined with high sample weights allows the determination of very low water contents with an accuracy of a few ppm.

A great variety of powders, granules and films can be tested. The HydroTracer is used primarily for testing the residual moisture of plastics, where the water content determines the quality of the product.

The absolute water content of the sample material is analysed by a chemical method - not by using the weight loss during heating, a method which only gives a prognosis of the relative moisture content.

A calibration is not necessary before the measurement.

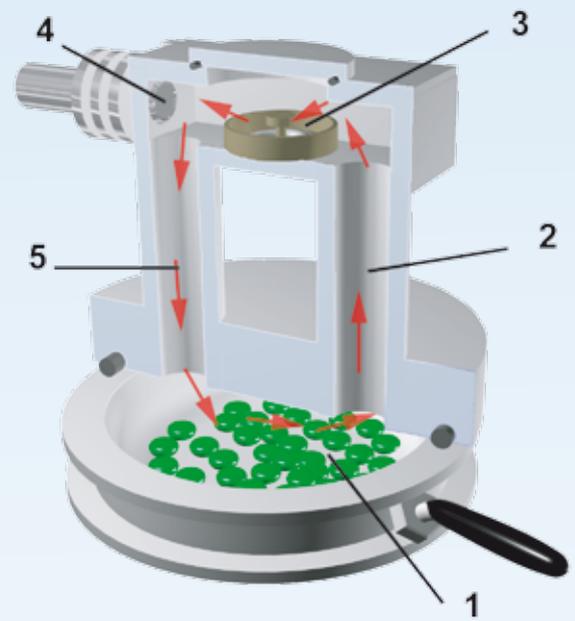
The compact design and the easy operation allow the use in the production. Blue-collar workers are able to handle the HydroTracer without problems.

The robustness and the low weight recommends the device for mobile use, e.g. for acceptance tests of dryers or for material arrival tests.



Measuring Procedure

The sample material is weighed and filled into the sample tray. The sample tray itself is part of a reactor integrated within the Hydrotracer. A heater warms the sample to a temperature chosen by the operator. The heat forces the water to evaporate. The gaseous water reacts with the powdery reagent in a cooled area. Water is transformed into hydrogen. The concentration of hydrogen within the reactor atmosphere is a measure of the water content within the reactor. A gas sensor detects the hydrogen concentration. The moisture of the ambient air, which comes into the reactor at the beginning of the measurement, is detected by separate sensors and considered in the calculation of the water content of the sample. This method allows the precise analysis of the water content of the test material.



Reactor principle in a cutaway view

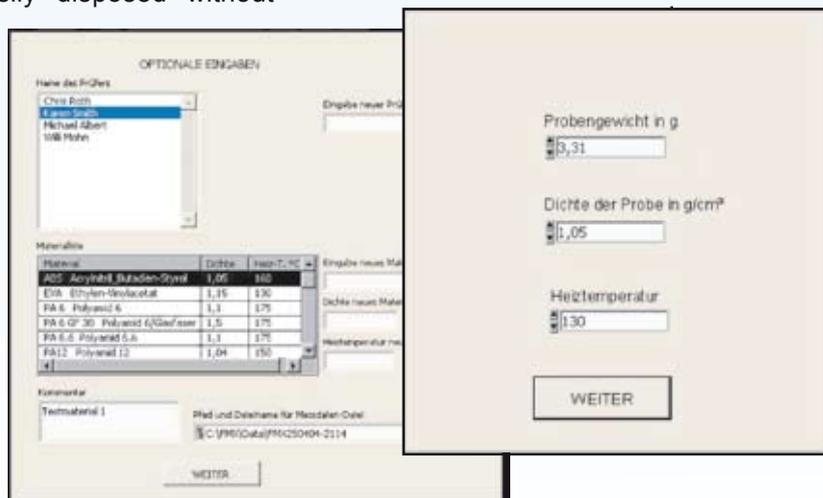
1. The test material is heated in the sample tray, water evaporates
2. The hot humid gas ascends
3. The reagent exchanges water by hydrogen
4. The sensor measures the concentration of hydrogen
5. The cooled gas descends and can absorb water again

The Reagent

The reagent calcium hydride is a powder which can be handled easily. The life time is nearly unlimited if kept airtight. Each test costs a few cent only. Calcium hydride reacts with water to calcium hydroxide which can be easily disposed without environmental hazards

The Operation

The HydroTracer is controlled by a program on an external PC. The operator is led through the sequence of manual test preparations by a picture-supported menu, thus avoiding handling errors. The test performs in a few steps only, consuming about 2 minutes of working time.



A short menu acquires the parameters first

The filling is advised by picture-supported instructions of the program. This method reduces severely the learning phase. Even unexperienced operators can perform a measurement without errors.



1. Lift lateral handles



2. Open reactor lid



3. Take out reagent bed



4. Change reagent



5. Take out sample tray



7. Fill in weighed sample



8. Clean seal face



9. Insert sample tray



10. Insert reagent bed



11. Clean seal and seal face

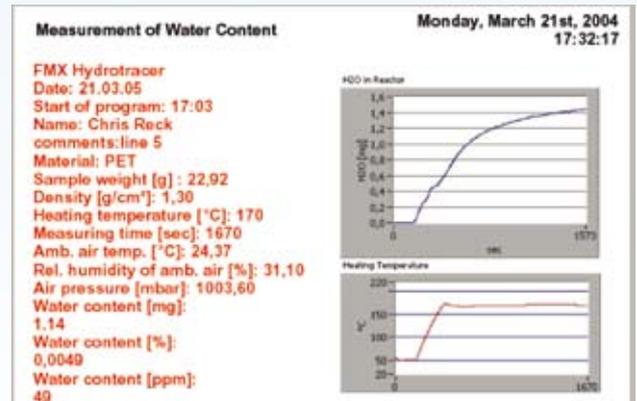


12. Close lid



13. Push down lateral handles

The further procedure runs automatically. The test report is saved after the measurement and the program stops. An integrated fan cools the reactor to the stand-by temperature of 50 °C. The HydroTracer is ready for the next measurement then. A test requires about 15 - 30 minutes.



The report is saved into a HTML-file and a spreadsheet

Material	FMX HydroTracer [% H ₂ O]	Karl-Fischer Titrator [% H ₂ O]	manometric [% H ₂ O]
ABS	0,0351 0,0422	0,0372	0,046
PE	0,0442 0,0278	0,0403	0,026
PA	0,1276 0,0351	0,1314	0,035
PET	0,0029 0,0042	0,0031	0,003
PET (flakes)	0,2779	0,2770	
PC	0,0203	0,0189	
PS	0,0520	0,0563	

TECHNICAL DATA

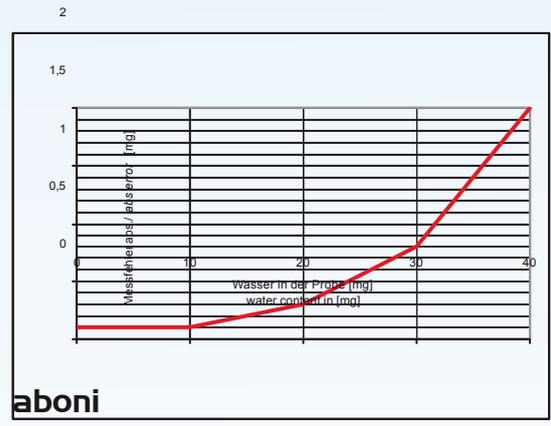
- Sample weight:
0,01 g to 50 g (100 g) , depending on density and moisture
- Sample volume:
approx. 50 cm³
- Reproducibility:
±0,1 mg H₂O (1 mg water content) up to
±0,3 mg H₂O (20 mg water content); see diagram
- Display via PC:
absolute water content of sample in x.xx mg
relative water content in % and ppm
add. amb. air data: temperature, relative humidity and pressure
- Absolute measuring range:
0.2 mg to 30 mg H₂O
- Relative measuring range:
0.0005 % - 5 % moisture content
- Accuracy:
see diagram
- Test temperatures:
50°C up to 210 °C in 1°C-steps
- Reagent:
CaH₂ powder
each test consumes approx. 0.1 g
- Amb. air temperature:
in °C in 0.1 °C steps
- Amb. air pressure:
700-1100 mbar in 1 mbar-steps
- Relative air humidity:
10 .. 100 % in 0.1 % -steps
- Power supply:
230 VAC or 115 VAC or 100 VAC
- Weight:
4.6 kg
- Dimensions:
285 mm x 170 mm x 250 mm (h x w x d)
- Interface:
Bi-directional RS 232 interface

required PC:
Windows® 98, ME, 2000, NT, XP
Pentium® 233 or equivalent
64 MB RAM minimum, 128 MB recommended
serial interface RS 232 or USB via adapter



Small, robust and easy to carry

Messgenauigkeit FMX HydroTracer
Accuracy



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Technical data subject to alterations